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(54) IMPROVEMENTS IN OR RELATING TO COFFEE MIXTURES, METHODS OF PREPARING THEM, AND INFUSION BAGS CONTAINING SUCH COFFEE MIXTURES

(71) We, EDELFETTWERKE WERNE SCHLÜTER G.m.b.H & Co., a Germany Company, of Schnackenburgallee 202, 2000 Hamburg 54, Germany, do

hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention concerns improvements in or relating to coffee mixtures, methods of preparing them, and infusion bags containing such coffee mixtures. The invention is especially (but not exclusively) concerned with the preparation of an infusion coffee mixture, made by grinding together a roasted coffee and a soluble coffee extract in a pre-determined ratio, this mixture being suitable for incorporation into an infusion bag which can by steeping in hot water yield coffee ready for drinking which is of good flavour.

It is generally well known that tea is portioned into infusion bags so that the user does not need any special equipment for brewing the tea, but can simply put the infusion bag together with hot water into a cup or pot to obtain the desired tea. When the steeping process is complete, the infusion bag is removed from the cup or the pot so that no tea sediments remain therein, and so that no tea strainer is necessary.

So far it has not been possible to successfully apply this same principle to coffee due to the fact that even extremely fine-ground roast coffee does not release sufficient amounts of flavour and aroma substances when steeped by using an infusion bag, so that the results obtained in this manner have been completely unsatisfactory. Virtually all coffee is therefore brewed from roast coffee in only two conventional methods: either by direct brewing with water or by filtration.

To avoid this type of brewing process, fully soluble instant coffee, particularly spray or freeze dried coffee which is completely soluble in hot water, is used to a great extent. This instant coffee, however, has certain flavor deficiencies due to the fact that the drying process damages or removes flavor and aroma substances.

It has already been attempted (German OS 16 92 260) to decrease or remove the flavor deficiencies of fully soluble instant coffee by adding to it a solid roast coffee component ground to colloidal fineness which was formed as a colloid containing extract by appropriate grinding and extraction and addition of a certain amount of liquid extract adjusted to a maximum pH of 5.2, followed by freeze drying. This freeze dried product, optionally mixed with dried liquid extract of fresh roast coffee, is then added to fully soluble instant coffee to improve its flavor and aroma while still maintaining a fully soluble coffee mixture. The preparation of this known mixture, however, is very expensive and costly, and achieves the desired result to only a limited degree.

It is furthermore already known (U.S. Patent 1,641,446) to mix ground roast coffee and coffee concentrate, in a ratio of approximately 20:1, and to form coffee tablets from such mixture, whereby the concentrate serves as a bonding material. This type of coffee tablet simplifies the portioning of coffee, however, these known tablets are obviously only suitable for the preparation of coffee by direct brewing with water in a container or by filtration.

It is an object of this invention to create a coffee mixture which can be used in infusion bags and which produces a coffee which is equal in flavor to that brewed from ground roast coffee, particularly filtered coffee.

We have found that a coffee mixture suitable for infusion can be prepared in the form of a mixture of roast coffee and instant coffee which is moreover suitable for use in

infusion bags. We have also found that this coffee mixture can be readily prepared by grinding a mixture of roast coffee beans or pre-ground roast coffee beans and instant coffee, in a weight ratio of between about 0.5:1 and about 5.5:1, in such a manner that the particles of instant coffee adhere to the roast coffee particle surfaces formed in the grinding operation.

In accordance with the invention, the problem of providing an infusion coffee with brewed coffee flavour is solved by simultaneously grinding or pulverizing roast coffee together with fully soluble instant coffee. Preferably, the mixture of roast coffee and instant coffee is combined in a ratio of 3.5:1 to 5.5:1, particularly about 4.1 to about 5:1, parts by weight of roast coffee beans to parts by weight of instant coffee, but alternatively it is possible to use pre-ground roast coffee instead of beans, in which case the chosen mixture ratio should be from about 1:1 to about 1:2, especially from about 1:1.2 to about 1:1.7, and even more preferably from about 1:1.5, parts by weight of pre-ground roast coffee to parts by weight of instant coffee.

Surprisingly, it has been found that in using a coffee mixture prepared in this manner, the roast coffee on the one hand, releases flavor and aroma substances into the hot water to an extent previously unencountered with finely ground roast coffee filled in infusion bags used by itself. The instant coffee, on the other hand, contributes to the increase in flavor and aroma, without evidence of the undesirable after-taste which is characteristic for this type of instant coffee.

This pure roast coffee flavor is particularly obtained when the above mentioned mixture ratios are adhered to. If the amount of instant coffee in the mixture is increased above a certain level, its characteristic, undesired after-taste becomes noticeable. On the other hand, if smaller amounts of instant coffee are used, a relatively large amount of the coffee mixture is required to obtain the desired coffee flavor. The use of larger amounts is however, economical because a unit weight of roast coffee is significantly cheaper than a unit weight of fully soluble instant coffee. For instance, it has been found that when a mixture of about 4 g or 5 g of roast coffee beans and about 1 g of instant coffee is prepared in accordance with the invention and filled into an infusion bag and used to make coffee by steeping in hot water there is obtained coffee which has a concentration equal to or even greater than that of coffee obtained by conventional filtration of 7.5 g of the same type of roast coffee. Additionally, the same good flavor of roast coffee is obtained, without any detectable taste of the added instant coffee.

In a further example, a cup of coffee was prepared from 5.5. g of a coffee mixture prepared in accordance with the invention using a mixture ratio of 4.5:1 parts by weight of roast coffee beans to parts by weight of instant coffee, and another cup of coffee was prepared by filtration from 7.5 g of the same roast coffee as used in the coffee mixture, ground to the same degree of fineness. Comparison showed that the coffee prepared from the coffee mixture was more concentrated and more aromatic than the filtered coffee.

It has been found that virtually any type of roast coffee as well as any type of instant coffee, particularly spray or freeze dried coffee, is suitable for use in this process, the intensity of the characteristic undesirable taste of the instant coffee used should be taken in consideration when choosing the mixture ratio.

The preparation of a coffee mixture in accordance with the invention has been accomplished, for example, by filling appropriate amounts of roast coffee and instant coffee, particularly freeze dried coffee, into a grinder with a grinding mechanism, the grinding mechanism parts of which are housed in plastic, and by carrying out the grinding and pulverizing process until the desired degree of pulverization is obtained. It must be assumed that the electrostatic charges created in this grinding and pulverization process in a grinder with a plastic housing contribute to the increased and improved adhesion of the relatively small particles of pulverized instant coffee to the freshly fractured areas of the roast coffee particles, thereby preventing the loss of flavor and aroma substances particularly well.

In one example, the grinding and pulverizing process was continued until the amount of roast coffee with a maximum grain size of 250 microns to 500 microns was not greater than 20% by weight and preferably not greater than 15% by weight relative to the total amount of the mixture, and the main portion, 50% or more of the instant coffee had a particle size of approximately 20 to 40 microns.

Tests with coffee mixtures prepared in accordance with the invention have shown the following results:

Test I

In this test a coffee mixture of roast coffee and fully soluble instant coffee, prepared in accordance with the invention, of 4 parts by weight of roast coffee and 1 part by weight of instant coffee was filled into infusion bags in amounts of 6.0 g each, and coffee was prepared from these infusion bags as well as from the freeze dried instant coffee used in

the preparation of the coffee mixture, using an amount of 1.6 g per cup. The coffees prepared in this manner were tested by 25 female and 25 male test persons, and of these test persons, 70% found the coffee made from the coffee mixture prepared in accordance with the invention to be clearly better in flavor than the coffee prepared from the instant coffee, 22% of the test persons found the two coffees to be equally good, and 8% of the test persons preferred the coffee prepared from the instant coffee, because they felt the infusion bag coffee did not have a sufficiently intensive taste.

Test II

The same coffee mixture prepared in accordance with the invention and the same amount per infusion bag as used in Test I were used, and additionally, coffee was prepared by filtration from the roast coffee used in the coffee mixture prepared in accordance with the invention, whereby 7.5 g of roast coffee were used per cup.

The same test persons used in Test I tested the two coffees prepared in this manner, and 60% of the test persons did not detect any difference between the two coffees, while 36% of the test persons preferred the coffee prepared from the roast coffee, because they found its aroma stronger than the aroma of the coffee made with the coffee mixture prepared in accordance with the invention. Four percent of the test persons found the coffee made with the coffee mixture prepared in accordance with the invention to be better than the coffee prepared from the roast coffee.

These tests show that the coffee made from the coffee prepared in accordance with the invention was considered better than coffee prepared from instant coffee by the majority of the test persons, and that the majority of the test persons was not able to detect a difference as compared to coffee prepared by filtration from conventional roast coffee, while some test perons even found the coffee made with the coffee mixture prepared in accordance with the invention to be better than the coffee obtained from roast coffee by filtration.

Thus, the coffee composition of this invention is a coffee mixture suitable for use in infusion bags, which contains ground roast coffee and which is characterized by the fact that particles of instant coffee are deposited on the fractured surfaces of the roast coffee particles, and that the mixture ratio of parts by weight of roast coffee to parts by weight of instant coffee is between about 1:2 and about 5.5:1, particularly 1:1.5 and 5:1, preferably 1:1 and 5:1, and even more preferably between 4:1 and 5:1. Preferably, the particles of instant coffee adhere to the roast coffee particles due to electrostatic charges.

WHAT WE CLAIM IS:-

1. A process for preparing a coffee mixture of roast coffee and instant coffee which is suitable for use in infusion bags, comprising grinding or pulverizing fully soluble instant coffee and roast coffee together.

2. A process in accordance with Claim 1, wherein roast coffee beans and instant coffee in a mixture ratio of about 3.5:1 to about 5.5:1 parts by weight of roast coffee to parts by weight of instant coffee, are ground or pulverized together.

3. A process in accordance with Claim 2, wherein roast coffee beans and instant coffee in a mixture ratio of about 4:1 to about 5.1 parts by weight of roast coffee to parts by weight of instant coffee, are ground or pulverized together.

4. A process in accordance with Claim 1, wherein pre-ground roast coffee and instant coffee in a mixture ratio of about 1:1 to about 1:2 parts by weight of roast coffee to parts by weight of instant coffee, are ground or pulverized together.

5. A process in accordance with Claim 4 wherein pre-ground roast coffee and instant coffee in a mixture ratio of about 1:1.2 to about 1:1.7 parts by weight of roast coffee to parts by weight of instant coffee, are ground or pulverized together.

6. A process in accordance with Claim 4 wherein pre-ground roast coffee and instant coffee in a mixture ratio of about 1:1.5 parts by weight of roast coffee to parts by weight of instant coffee are ground or pulverized together.

7. A process in accordance with any of Claims 1 through 6, wherein the grinding or pulverizing is continued until the amount of roast coffee with a maximum grain size of 250 microns to 500 microns, relative to the total amount of the mixture, is not greater than 20% by weight.

8. A process in accordance with any of Claims 1 through 7, wherein the grinding or pulverizing is continued until the amount of roast coffee with a maximum grain size of 250 microns to 500 microns, relative to the total amount of the mixture, is not greater than 15% by weight.

9. A coffee mixture suitable for use in infusion bags comprising ground roast coffee and soluble instant coffee, wherein the particles of soluble instant coffee are deposited on the fractured surfaces of the roast coffee particles, and the ratio of parts by weight of roast coffee to parts by weight of instant coffee is between about 1:2 and 5.5:1.

10. A coffee mixture suitable for use in infusion bags comprising ground roast coffee and soluble instant coffee, wherein the particles of soluble instant coffee are depo-

sited on the fractured surfaces of the roast coffee particles, and the ratio of parts by weight of roast coffee to parts by weight of instant coffee is between about 1:1.5 to about 1:1.

11. A coffee mixture suitable for use in infusion bags comprising ground roast coffee and soluble instant coffee, wherein the particles of soluble instant coffee are deposited on the fractured surfaces of the roast coffee particles, and the ratio of parts by weight of roast coffee to parts by weight of instant coffee is between about 1:1 and 1:5.

12. A coffee mixture suitable for use in infusion bags comprising ground roast coffee and soluble instant coffee, wherein the particles of soluble instant coffee are deposited on the fractured surfaces of the roast coffee particles, and the ratio of parts by weight of roast coffee to parts by weight of instant coffee is between about 4:1 and about 5:1.

13. A coffee mixture in accordance with any of Claims 9-12 wherein the instant coffee particles adhere to the roast coffee particles due to electrostatic charges.

14. A coffee mixture in accordance with any of Claims 5 or 6, wherein the amount of roast coffee of a maximum grain size of 250 microns to 500 microns relative to the total amount of the mixture is not greater than about 20% by weight.

15. A coffee mixture in accordance with any of claims 9-14, wherein the amount of roast coffee of a maximum grain size of 250 microns to 500 microns relative to the total amount of the mixture is not greater than about 15% by weight.

16. A coffee bag comprising an infusion bag containing a mixture of roast coffee and soluble instant coffee prepared by grinding together roast coffee and instant coffee wherein the amount of roast coffee present is between about 0.5 and about 5.5 parts by weight for each part by weight of instant coffee.

17. A coffee bag in accordance with claim 16, wherein the total amount of coffee mixture contained in the infusion bag is between about 5 and about 6 grams of coffee mixture per infusion bag.

18. A process as claimed in any of claims 1 to 8 and substantially as herein described.

19. A coffee mixture whenever prepared by a process as claimed in any of claims 1-8 and/or 18.

20. A coffee mixture as claimed in any of claims 9 to 15 and substantially as herein described.

21. A coffee bag as claimed in claim 16 or claim 17 and substantially as herein described.

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